

AMENDMENTS TO THE CLAIMS

The listing of claims below replaces all prior versions of claims in the application.

1-13. (Cancelled)

14. (Currently Amended): A method of extracting ions from a linear ion trap to time-of-flight mass spectrometer, said ion trap being driven by a set of digital switches, said method comprising the following steps:

trapping said ions in said ion trap by ~~switching fast between a set of trapping states defined by discrete DC levels applied on the electrodes of said ion trap~~ applying trapping voltages having waveform created by fast switching of the application on electrodes of said ion trap between discrete DC levels;

cooling said trapped ions by collisions with a buffer gas down to equilibrium; and

extracting the trapped ions in said ion trap to said time-of-flight mass spectrometer by applying extracting levels on the electrodes of said ion trap under conditions, where said discrete DC levels applied on the electrode are kept constant, until all the trapped ions are extracted

~~switching from a pre-selected trapping state to a final ejection state in condition of pure electrostatic field within the ion trap in a pre-selected time by elongating the switching period of the trapping states.~~

15. (Previously Presented): A method of extracting ions from a linear ion trap as claimed in claim 14, where said set of trapping states consists of two states, each of said states lasts for half of a set period.

16. (Previously Presented): A method of extracting ions from a linear ion trap as claimed in claim 14, wherein said buffer gas fills said ion trap at pressures in the range from 0.01mTorr to 1mTorr.

17. (Original): A method of extracting ions from a linear ion trap as claimed in claim 15, wherein said set period is in the range from 0.3 micro seconds to 1.0 micro seconds.

18. (Previously Presented): A method of extracting ions from a linear ion trap as claimed in claim 15, where the final trapping state prior to said ejection state has a duration of approximately one quarter of said set period.

19-20. (Cancelled)

21. (New): A method of extracting ions from a linear ion trap as claimed in claim 14, wherein an opposite pair of electrodes (Y pair) of said set of electrodes is connected to a first subset of said digital switches capable of switching at a repetition rate, and at least one of another oppositely positioned pair of electrodes (X pair) of said set of electrodes is connected to a second

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subset of said number of said digital switches which has a higher voltage rating, said second subset of digital switches connects DC voltage supply to said X electrodes for election of said ions.

22. (New): A method of extracting ions from a linear ion trap as claimed in claim 21, wherein said first subset of said number of said digital switches includes 2 serially linked high repetition switches, switching between a positive and negative voltage to provide said Y pair of electrodes of said electrodes with a rectangular waveform.